

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with attorney Brandt D. Madsen on 9/29/2011.

EXAMINER'S AMENDMENT

Claim 1 (Currently Amended) A thin film deposition apparatus having a reaction chamber for forming a thin film on a plurality of substrates rested on a susceptor, the apparatus comprising:

a gas supply means for supplying a plurality of gases to the inside of the reaction chamber from the outside, the gases including a reaction gas;

a gas distribution means for distributing and spraying the gases supplied from the gas supply means so as to conform to the purpose of a process;

a gas retaining means for partitionally accommodating and concurrently retaining the gases distributed from the gas distribution means, the gas retaining means comprising:

an upper plate having a bottom face; and

a plurality of partition walls protruding from the bottom face and installed at regular intervals below the bottom face, such that the partition walls define therebetween a plurality of reaction cells below the upper plate, all wherein the

Art Unit: 1716

partition walls are configured so as to increasingly broaden the width of the reaction cells from the inside to the outside of the gas retaining means and to partitionally accommodate and concurrently retain the respective gases distributed from the gas distribution means wherein the partition wall is further provided, at both lower end sides thereof, with an extension plate extended in parallel to the susceptor, so that gas mixing between neighboring reaction cells is restricted;

a rotation driving means for rotating selectively one of the gas retaining means and the susceptor such that the gases concurrently retained in the respective reaction cells are exposed to the substrates in sequence; and

a gas exhaust means for pumping the gases retained by the gas retaining means to the outside of the reaction chamber;

wherein the gas distribution means further comprises a fixing means for fixing the gas retaining means;

a distribution main body inserted into the central portion of the upper plate and closely contacting the respective partition walls;

a gas inlet ports formed in the distribution main body such that gases supplied from the gas supply means are individually introduced;

a distribution chamber fluid-communicated with the gas inlet ports and having a desired space formed therein for partitionally accommodating the respective gases; and

a plurality of lateral spray ports formed in the later face of the distribution main body such that the gases accommodated in the distribution chamber are sprayed to the lateral faces of the respective reaction cells.

Claim 10 (~~Original~~ currently amended) The apparatus of claim ~~9~~ 1, wherein the spacing between the extension plate and the substrate is maintained below 3mm while not contacting each other.

Claim 13 (~~Original~~ currently amended) The apparatus of claim ~~12~~ 1, wherein, among the distribution chambers, a distribution chamber accommodating a purge gas is further provided with a downward spray port formed in the bottom face of the distribution main body, along with the lateral spray port, such that the purge gas can be sprayed vertical-downwardly.

Claim 14 (~~Original~~ currently amended) The apparatus of claim ~~12~~ 1, wherein the fixing means further comprises:

- a plurality connection grooves formed in the distribution main body; and
- a connection protrusion formed in on end portion of the respective partition walls so as to be inserted and connected into the connection groove.

Claim 15 (~~Original~~ currently amended) The apparatus of claim ~~12~~ 1, wherein among the distribution chamber, distribution chambers, to which identical gases are supplied, are fluid- communicated with each other.

Claim 16 (~~Withdrawn Previously Presented~~ currently amended) The apparatus of claim 1, wherein the gas retaining means further comprises:

- a shower head divided in plural such that gases distributed from the gas distribution means are sprayed vertical-downwardly through a plurality of spray ports formed in the bottom face thereof; and

Art Unit: 1716

a plurality of partition walls formed at regular intervals in the bottom face of the shower head such that a plurality of reaction cells are formed correspondingly to the respective shower heads.

Claim 17 (~~Withdrawn Previously Presented~~ currently amended) The apparatus of claim 16, wherein the gas distribution means further comprises:

a fixing means for fixing the gas retaining means;

a distribution main body having the form of a circular plate and inserted into the central portion of the shower head;

a plurality of gas inlet ports formed in the distribution main body such that gases supplied from the gas supply means are individually introduced;

a distribution chamber fluid-communicated with the gas inlet ports and having a desired space for partitionally accommodating the respective gases; and

a plurality of lateral spray ports formed in the later face of the distribution main body such that the gases accommodated in the distribution chamber are sprayed to partitioned spaces of the inside of the shower head.

Claims 1 - 3 and 6 - 22 are allowed.

Claims 4 and 5 were already canceled.

Withdrawn claims 16 and 17 are rejoined with claim 1.

Withdrawn claims 23 – 29 are canceled.

Allowable subject matter

The following is an examiner's statement of the reasons for allowance:

The prior art does not teach or suggest a thin film deposition apparatus comprising a showerhead having a gas retaining means comprising a plurality of partition walls protruding from the bottom face and installed at regular intervals below the bottom face, such that the partition walls define therebetween a plurality of reaction cells below the upper plate, wherein the partition walls are configured so as to increasingly broaden the width of the reaction cells from the inside to the outside of the gas retaining means and to partitionally accommodate and concurrently retain the respective gases distributed from the gas distribution means. The apparatus further comprises a rotation driving means for rotating selectively one of the gas retaining means and the susceptor such that the gases concurrently retained in the respective reaction cells are exposed to the substrates in sequence. The gas distribution means further comprises a plurality of lateral spray ports formed in the later face of the distribution main body such that the gases accommodated in the distribution chamber are sprayed to the lateral faces of the respective reaction cells.

Any comments considered necessary by the applicant must be submitted no later than the payment of the issue fee and to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SATISH CHANDRA whose telephone number is (571)272-3769. The examiner can normally be reached on 8 a.m. - 4:30 p.m..

Art Unit: 1716

If attempts to reach the examiner by telephone are unsuccessful, Primary Examiner, Ram Kackar can be reached on 571-272-1436. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Satish Chandra/
Examiner, Art Unit 1716

/Ram N Kackar/
Primary Examiner, Art Unit 1716